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JOHN FLAXMAN ESQR R.A.
SCULPTOR.

Bellichal by W. Nattale, 1828.

# ANATOMICAL STUDIES

OF THE

### BONES AND MUSCLES,

FOR

THE USE OF ARTISTS,

FROM DRAWINGS BY THE LATE

## JOHN FLAXMAN, ESQ. R.A.

ENGRAVED BY

HENRY LANDSEER;

WITH TWO ADDITIONAL PLATES;

AND

EXPLANATORY NOTES,

BY

WILLIAM ROBERTSON.

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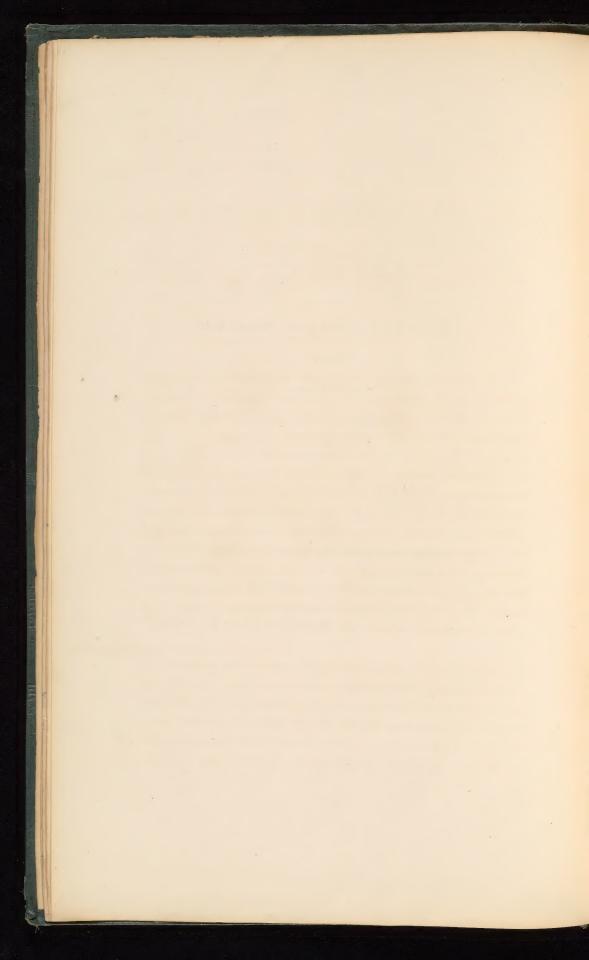
### ADMIRATION OF HIS TALENTS,

AND GRATEFUL ACKNOWLEDGEMENTS FOR

HIS VALUABLE ADVICE DURING THE PROGRESS OF ITS PUBLICATION,

BY HIS MUCH OBLIGED AND OBEDIENT SERVANTS,

W. ROBERTSON AND M. A. NATTALI.



#### PREFACE.

The formality of a Preface to the present Work would have been gladly avoided, but for the apparent expediency of giving some explanation concerning the nature and object of a publication which claims, on specific grounds, the patronage of a large and increasing class of readers and students.

An intimate knowledge of the human frame in its anatomical structure, is only to be obtained by long and laborious examination, assisted by the use of the knife amid the offensive details of the dissecting-room; or, though of course more superficially, by the study of an extensive series of delineations and descriptions. And, after all, excepting to professional men, the practical or speculative uses of an application so close and protracted, would bear little proportion to the time and pains spent in the prosecution. On the other hand it is essential to every educated man, that he should acquire a general knowledge of the corporeal system, of its springs and movements—the sources of its vitality, and the mechanism of its activity.

One of the most important and attractive sections of this investigation, will be found clearly and effectually illustrated in the following Plates. They have been carefully copied from the drawings of a man who had made the laws of muscular action his most particular and successful study, and whose skill as a draughtsman enabled him to give the most expressive character of nature to his transcripts from the dissected limb. He compared the collapsed with the working muscle, and while

he drew it in the flaccidity of death, his crayon gave indication of its play and tension in the elasticity of life.

But while these Plates are recommended to general readers as instructive and ably executed diagrams of the exterior muscles, they are with still higher confidence offered to Students of Art, as the productions of an Artist of the highest order, whose name they have been accustomed to associate with those of Buonardia and Donatello in days of yore, and with those of Chantrey and Canova in our own time. To announce these exhibitions of muscular mechanism as the studies made by Flaxman for his own use and instruction, is to give them a practical recommendation superior to all critical eulogy. We have here the exemplification of his labours; the secret of his processes; and all that need be urged on the young Student is to follow in the Master's steps.

It is believed that these delineations supply an important deficiency in the artist's educational apparatus. The splendid work of Albinus is not only prohibited by its costliness, but is too extensive in its nature, and too rigid in its execution, to meet the exigencies of the student; he wants, not the developement of a statue, but the expression of living fibre, so far as it may come within the command of the pencil. The folios of Vesalius contain invaluable materials, but the student would find himself bewildered amid their complication and technicality; nor does the selection made by Tortebat adequately meet the requirements of the artist: ascribed to Titian, though in reality from the drawings of Van Kalcker, they are yet far from satisfactory. They err both in excess and in defect; fewer and more expressive details, with superior execution, would have brought them nearer the mark.

Under these circumstances, the publisher ventures to indulge the hope, that these drawings, with their descriptions, will be found to have supplied an acknowledged and urgent deficiency, and that while they furnish the beginner with suitable instruction, they may serve also as a vade-mecum to the more advanced student.

#### NAMES OF THE BONES.

Os frontis. Α Ossa bregmatis. В С Os temporum. Os occipitis. The mastoid process. Os jugale, (os malare,) or cheek-bone. E The upper jaw. F The lower jaw. G Clavienla Scapula. Caracoide process of the scapula. b Acromiun of the scapula. Spine of the scapula. Base of the scapula. Humerus. Head of the humerus. A sulcus, or furrow, through which passes one of the heads of the biceps.

Outer protuberance of the humerus, from which arise the muscles that extend the wrist and fingers.

Inner protuberance of the humerus, from which arise the muscles that bend the wrist and fingers. Radius. L. M Ulna. Olecranon. Bones of the carpus, or wrist. N 0 Bones of the metacarpus. P Bones of the thumb. Bones of the fingers. 0 R Seven vertebræ of the neck. S Twelve vertebræ of the back. Five vertebræ of the loins. U The seven true ribs, 1, 2, 3, 4, 5, 6, 7. The five false ribs, 8, 9, 10, 11, 12. Os sacrum.  $\mathbf{v}$ W Os coccygis. Os ilium Spine of the ilium. Y Os ischium. Obtuse process of the ischium. m Z Os pubis. Femur  ${\cal A}$ Head of the femur.  $Great\ trochanter.$ Lesser trochanter. p Spine of the femur. q Inner protuberance of the femur. Outer protuberance of the femur. В Patella. Tibia. CD Fibula. Lower appendix of the tibia or inner ankle. Lower appendix of the fibula or outer ankle. Tarsus, or instep, composed of six bones, besides the os calcis. GBones of the metatarsus.

Bones of the toes.

### NAMES OF THE MUSCLES.

| _  | NAME                          | ORIGIN AND INSERTION.  | USE.  |
|----|-------------------------------|--|---|
| 1  | Occipito frontalis.           | From the occipital tuberosity; the tendon is expanded over<br>the superior part of the cranium, and is inserted into the<br>teguments of the forehead and eye-brows.                             | To move the skin and raise the eyebrows.  |
| 2  | Levator auris.                | From the tendon of the occipitis, and is inserted into the upper part of the ear, which is connected with the head.  | The action of this muscle is scarcely perceivable.  |
| 3  | Orbicularis palpe-<br>brarum. | Surrounds the eye-lids on the edge of the orbit, and is fixed to the transverse suture, which crosses the nose from the corner of the eye.   | Shuts the eye-lids.   |
| 4  | Masseter.                     | From the higher part of the upper jaw, and is inserted into the lower part of the under jaw.   | To raise the jaw and draw it obliquely outwards.  |
| 5  | Zygomaticus.                  | From the os malæ, near the zygomatic suture, and is inserted into the angle of the mouth and the orbicularis oris.   | To raise the corners of the mouth and to draw it outwards.  |
| (i | Levator labin.                | By two heads, one from the orbitar process, the other from<br>the nasal process of the superior maxilla, and is inserted<br>into the upper lip, and the outer part of the wing of the<br>nose.   | To raise the upper-lip and dilate the nostrils.   |
| 7  | Orbicularis oris.             | Formed by the insertion of the fibres of other muscles, and constitutes the principal part of the lips; it is inserted into its fellow at the angles of the mouth.                               | To shut the mouth.  |
| 8  | Depressor labii inferioris.   | From the inferior part of the lower jaw, next the chin; runs obliquely upwards, and is inserted into half the edge of the under lip.   | To depress the under-lip.   |
| 9  | Levator anguli oris.          | From immediately below the infra orbitar foramen, and is inserted into the corner of the mouth.  | To raise the corner of the mouth.   |
| 10 | Depressor anguli oris.        | From the under part of the lower jaw, at the side of the chin, and is inserted into the angle of the mouth.  | To depress the corner of the mouth.   |
| 11 | Sternohyoideus.               | From the sternum, the clavicle, and the cartilage of the first rib, and is inserted into the base of the os hyoideus.  | To depress the os hyoideus.   |
| 12 | Mastoideus.                   | By two distinct origins from the sternum and part of the clavicle, and is inserted into the mastoid process.   | To turn the head to one side and bend it forward.   |
| 13 | Trapezius.                    | From the hinder part of the head, from the spines of the vertebræ of the neck and the eight upper ones of the back, and is inserted into the spine and acromiun of the scapula and the clavicle. | To move the clavicle, scapula, head, and neck. This muscle, passing over the scapula, contributes very much to a certain roundness which we see in that part. |

| -   | NAME.   | ORIGIN AND INSERTION.   | NO.   |
|-----|---|---|---|
| -   |   | ORIGIN AND INSERTION.   | USE.  |
| 14* | Spleneus.   | From the three lower vertebræ of the neck and the five upper ones of the back, and is inserted above the mastoide process.  | To move the head backwards and side-<br>ways.                                 |
| 15  | Pectoralis.   | From part of the clavicle, from the sternum and from the six upper ribs, and is inserted, by a strong tendon, into the humerus, four fingers' breadth below its head.   | Moves the arm forwards and upwards towards the sternum.                       |
| 16  | Deltoides.  | From the outer part of the clavicle, from the spine and<br>acromiun of the scapula. It is composed of several<br>lobes or parcels of flesh, which all join in one tendon,<br>and are inserted into the outside of the humerus, four<br>fingers' breadth below its head.   | To raise the arm and assist it in every motion, except that of depressing it. |
| 17  | Biceps.   | By two heads, one of which arises from the upper edge of<br>the scapula; they both unite about the middle of the<br>arm and make one belly, which is inserted, by a strong<br>round tendon, into the tuberosity, at the upper end of<br>the radius.   | To bend the fore-arm.   |
| 18  | Brachiæus internus. (This is partly covered by the biceps, and is marked with two figures, to prevent its being taken for two muscles.) | From the middle and internal part of the humerus, on each side of the deltoides, and is inserted into the upper and fore part of the ulna.  | To bend the fore-arm.   |
| 19  | Gemellus, or triceps<br>brachialis.   | Is composed of the brachiæus externus, which arises about the middle and hinder part of the humerus; the musculus longus, which arises from the lower side of the scapula; and the musculus brevis, which arises from the hinder part of the humerus. These three make one tendon, which covers the elbow, and is inserted into the hinder part of the olecranon. | To extend the fore-arm.   |
| 20  | Anconæus.   | From the back part of the outer protuberance of the hume-<br>rus, and is inserted into the ulna, four fingers' breadth<br>below its head.   | Helps to extend the arm.  |
| 21  | Pronator teres.   | From the inner protuberance of the humerus, where those<br>bending the wrist and fingers arise, and descends obliquely<br>to its insertion, a little above the middle of the radius.  | To roll the radius together, with the hand inwards.                           |
| 23  | Supinator radii longus.   | From the ridge of the humerus above the outer protuberance, and is inserted into the lower part of the radius.  | Rolls the radius outwards, and, consequently, the palm of the hand upwards.   |
| 28  | Extensor carpi ra-<br>dialis brevis.  | From the outer protuberance of the humerus into the root of the metacarpal bone of the little finger.   |   |
| 24  | Extensor carpi radialis longus.   | From the outer protuberance of the humerus, and is inserted into the bones of the metacarpus that sustain the fore and middle fingers.  | To extend the wrist and hand.   |
|     |   |   |   |

| 25<br>26 | NAME.  Extensor pollicis.   | ORIGIN AND INSERTION.  From the hinder part of the middle of the radius and ulna, and, passing obliquely over the tendon of the extensor   | Extends the thumb.   |
|----------|---|--|--|
| 26       | (   | carpi radialis, is inserted, by two or three tendons, into the bones of the thumb.   |  |
|          | Extensor digitorum.   | From the outer protuberance of the humerus and from the outer part of the radius and ulna at the wrist; it is divided into three tendons, which are inserted into the bones of the first three fingers.  | Extends the fingers.   |
| 27       | Extensor carpi ul-  | From the outer protuberance of the humerus and ulna into the root of the metacarpal bone of the little finger.   | To extend the wrist and hand.  |
| 28       | Flexor carpi ulnaris.   | From the inner protuberance of the humerus and ulna, and is inserted into the little bone of the wrist.  |  |
| 29       | Flexor carpi radialıs.  | From the inner protuberance of the humerus, upper and fore part of the ulna, and is inserted into the first bone of the metacarpus that sustains the fore finger.  | >Bends the wrist and hand.   |
| 30       | Palmaris.   | From the inner protuberance of the humerus, and passing<br>by a slender tendon to the palm of the hand, expands<br>itself, and is inserted into the bones of the metacarpus<br>and into the first bones of the fingers.  | Helps the hand to grasp any thing closely.   |
| 31       | Perforatus and per-<br>forans is the mass<br>of flesh that ap-<br>pears under the<br>flexor carpi radi-<br>alis and palmaris. | The perforatus arises from the inner protuberance of the humerus and from the radius, and coronoid process of the ulna, and is divided into four tendons, which are inserted into the second bones of the fore finger. Just above their insertion they are perforated or split, to give a passage to the tendons of the perforans, which arises from the upper part of the ulna, and is likewise divided into four tendons, which pass through the perforations just mentioned, and are inserted into the third bones of the fore fingers. | To bend the fingers.  N.B. The muscles of the fore arm are never so strongly marked as when the hand is shut, or grasps something with all its strength, because then the internal muscles acting, the external ones are swelled more than ordinary. |
| 32       | Infra spinatus.   | From the cavity below the spine of the scapula, and filling that cavity, is inserted into the humerus a little below its head.   | Draws the arm downwards and backwards.   |
| 33       | Teres minor.  | From the inferior costa of the scapula adhering to the capsular ligament, and is inserted into the outside of the external tubercle of the humerus below the infra spinatus.   | To roll the humerus outwards and to draw it backwards.   |
| 34       | Teres major.  | From the lower angle of the scapula, and is inserted into the humerus with the latissimus dorsi.   | Helps to draw the arm downwards and backwards.   |
| 35       | Coraco brachialis.  | From the coracoid process of the scapula, and is inserted into about the middle of the humerus at its inner side.  | To raise the arm upwards and forwards.   |

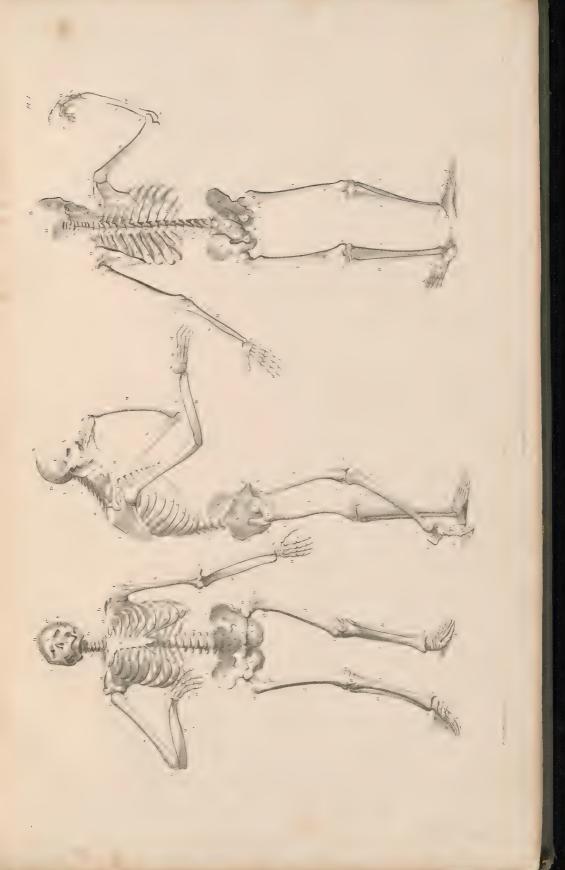
|     | NAME.                      | ORIGIN AND INSERTION.   | USE.   |
|-----|----------------------------|---|--|
| 36  | Rectus.                    | From the stemum and the two last true ribs, and is inserted into the os pubis.  | Raises the body when we lie on the back, and sustains it when it is bent backwards; it has three or four nervous or tendinous intersections or bands which divide it, and make it appear like several muscles: the third of these bands is not in every body exactly in the same place, it being sometimes even with the navel, and sometimes higher, and sometimes there is one of those bands below the navel. |
| 37  | Obliquus descendens.       | From the two last true and the five false ribs, by five or<br>six digitations, the four uppermost of which lie between<br>the teeth of the serratus major anticus, it descends<br>obliquely by a broad and very thin tendon, and passing<br>under the rectus is inserted all along the linea alba to<br>the upper and fore part of the spine of the ilium, and to<br>the fore part of the os pubis. | Assists in expiration, and occasionally in discharging the stomach and belly of its contents.  |
| 38  | Serratus major anticus.    | From the six lower true ribs and from the first and some-<br>times the second of the false ones by so many distinct<br>portions, resembling the teeth of a saw, and is inserted<br>into the base of the scapula.  | Moves the scapula forwards, and when<br>the scapula is forcibly raised to draw<br>upwards the ribs.  |
| 39  | Latissimus dorsi.          | From the hinder part of the spine of the ilium, from the upper spine of the os sacrum, from the spines of all the vertebræ of the loins, and from the seven lower ones of the back, it passes by the lower angle of the scapula to which some of its fibres are fixed, and joining with the teres major is inserted with it into the humerus, three fingers' breadth below its head.                | Helps to draw the arm downwards and obliquely backwards.  This muscle at its insertion is so thin that it does not hinder your seeing the action of the muscles that are underneath it, but towards its insertion it becomes very thick and fleshy.  |
| 70* | Longissimus dorsi.         | From the upper part of the os sacrum and back part of the spine of the ilium, and is inserted partly into the processes of the vertebræ of the back and partly into the ribs.   | These muscles keep the body erect, bend it backwards, and sustain it when it is bent forwards, and when they act only on one side they draw the body sideways.   |
| 11* | Sacro lumbalis.            | From the same origin as the last muscle, and is inserted into the back part of the ribs near their root.  | Although these two last and the spleneus are entirely covered by the trapezus and the latissimus dorsi, their action and shape appear very plainly.  |
| 42  | Gluteus medius.            | From the spine and dorsum of the ilium, and is inserted into the back part of the trochanter major.   | To pull the thigh outwards, a little backwards, and rotate it inwards.   |
| 48  | Gluteus major.             | From the external surface of the ilium and ischium, from<br>the os coccygis and os sacrum, and is inserted into the<br>thigh bone a hand's breadth below the great trochanter.  | To extend and rotate the thigh inwards.  |
| 44  | Membranosus, or Fascialis. | From the upper and fore part of the spine of the ilium, its<br>fleshy part terminates at the great trochanter, where its<br>membranous part begins, and spreading itself over the<br>muscles of the thigh passes to its insertion on the upper<br>part of the tibia.  |  |

|    | NAME.                     | ORIGIN AND INSERTION.   | USE.  |
|----|---------------------------|---|---|
| 45 | Semimembranosus.          | From the upper protuberance of the ischium, and is inserted into the upper and back part of the tibia.  | Helps to bend the leg.  |
| 46 | Semitendinosus.           | From the hinder protuberance of the ischium, and is inserted into the inner part of the tibia below its articulation with the fibula.   | N.B. These muscles form the inner ham-string.   |
| 47 | Biceps femoris.           | By two heads, one of which arises from the tuberosity of<br>the ischium, the other from the linea aspera of the thigh<br>bone, they both join together and are inserted by one<br>tendon into the upper part of the fibula.     | Helps to bend the leg, and is likewise employed in turning the leg and foot outwards when we sit down.  N.B. This muscle forms the outer hamstring.   |
| 48 | Vastus externus.          | From the great trochanter and external part of the femur, and is inserted with the following muscles.   | Extends the leg.  |
| 49 | Vastus internus.          | From the lesser trochanter and internal part of the femur, and is inserted with the following muscle.   | Extends the leg.  |
| 50 | Rectus femoris.           | From the lower part of the spine of the ihum; this and the last two muscles, just above the knec, make one strong tendon, which passes over the patella, to which it adheres, and is inserted into the upper part of the tibia. | Extends the leg.  When a figure stands upright and rests on one leg, there appears above the knee certain swellings, which are made by the tendon of these three muscles and the skin, which disappear when the knee is bent. |
| 51 | Sartorius.                | From the upper and fore part of the spine of the ilium<br>and descending obliquely over the thigh, is inserted into<br>the inner and upper part of the tibia.   | Crosses the legs in the manner tailors are used to sit, whence it has its name.   |
| 52 | Gracilis.                 | From the os pubis near its articulation, and is inserted into<br>the upper and inner part of the tibia.   | Helps to bend the leg and assists in bringing it and the thigh inwards.   |
| 53 | Triceps.                  | Is named from having three heads, the first and second arise from near the articulation of the os pubis, and the third from the tubercle of the ischium; they are inserted all along the spine of the femur.                    | Pulls the thigh inwards.  |
| 54 | Tibialis anticus.         | From the upper and outer part of the tibia, and is inserted into the inner os cuneiforme, and the base of the metatarsal bone of the great toe.   | To bend the foot.   |
| 55 | Extensor digitorum pedis. | From the upper part of the tibia, and is inserted by four tendons into the bones of the four small toes.  | Extends the toes.   |
| 56 | Peronæus Tertius.         | From the outer and upper part of the fibula and passing under the channel of the outer ancle, and is inserted into the outer bone of the metatarsus.  | To move the foot outwards.  |
| 57 | Tibialis posticus,        | From the back and upper part of the tibia and fibula, and is inserted into the os scaphoides, and partly into the under surface of the tarsal bones.  | To move the foot inwards and to turn the toes inwards.  |

|    | NAME.                         | ORIGIN AND INSERTION.   | USE.  |
|----|-------------------------------|---|---|
| 58 | Flexor longus pollicis.       | From the back part of the fibula below its head into the last joint of the great toe.   | To bend the great toe.  |
| 59 | Flexor longus digi-<br>torum. | From the upper and inner part of the tibia, and is inserted into the last bones of all the toes except the great toe.   | To bend the toes.   |
| 60 | Gasterocnemius.               | Has two distinct fleshy originations from the hindermost part of the two protuberances of the thigh bone; in their descent they are dilated into two fleshy bellies, the innermost of which is thickest and largest, and joining together make a broad strong tendon, which unites with the tendon of the solæus and is inserted with it. | Extends the foot.   |
| 61 | Solæus.                       | From the upper and back part of the tibia and fibula, and increases to a large fleshy belly, which lies under the gasterocnemius, and terminating in a very strong tendon, which by some is called the tendon of Achilles, is inserted into the hinder part of the os calcis.   | Extends the foot. The action of these two last muscles is very necessary in running, leaping, jumping, walking, and standing on tiptoe, and those who walk much or carry heavy burdens have these muscles larger than others. |

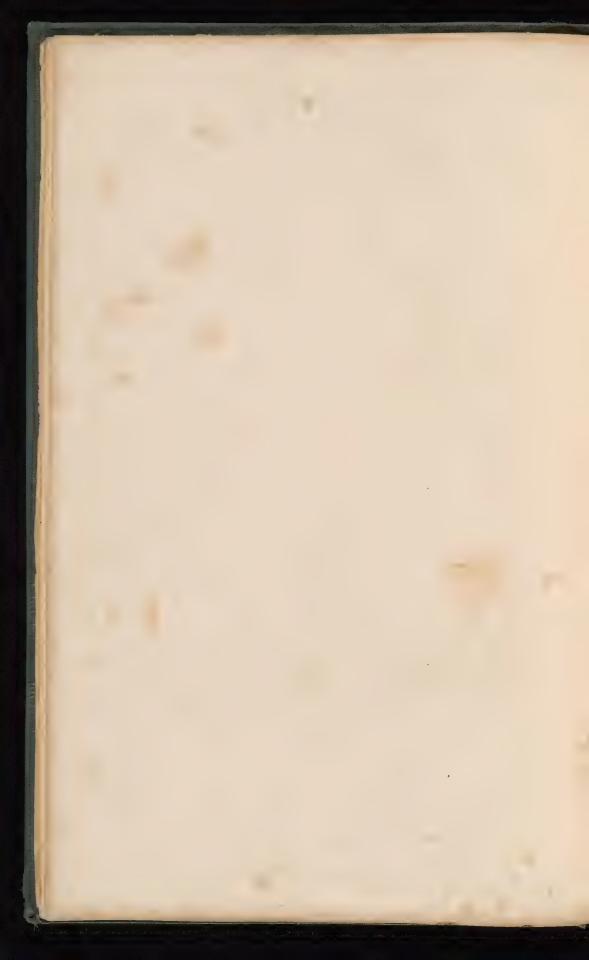
N.B.—Those Muscles marked with a Star lie underneath, but their action and shape appear very plainly.











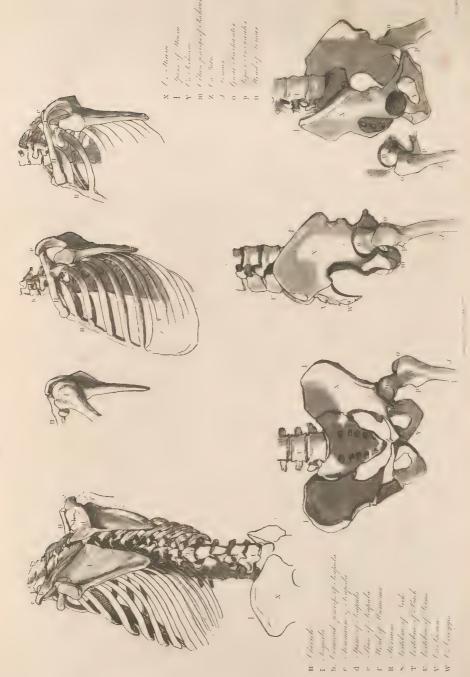


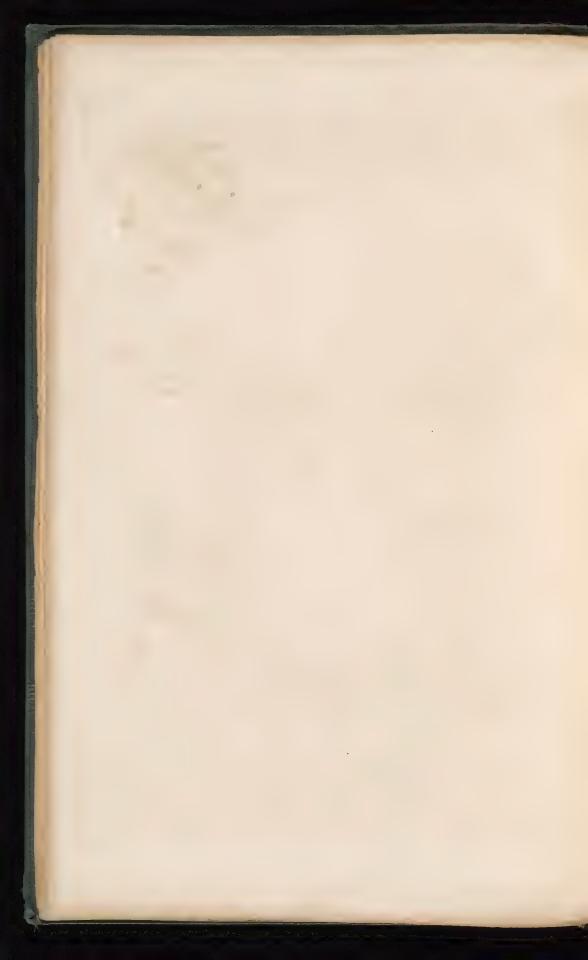


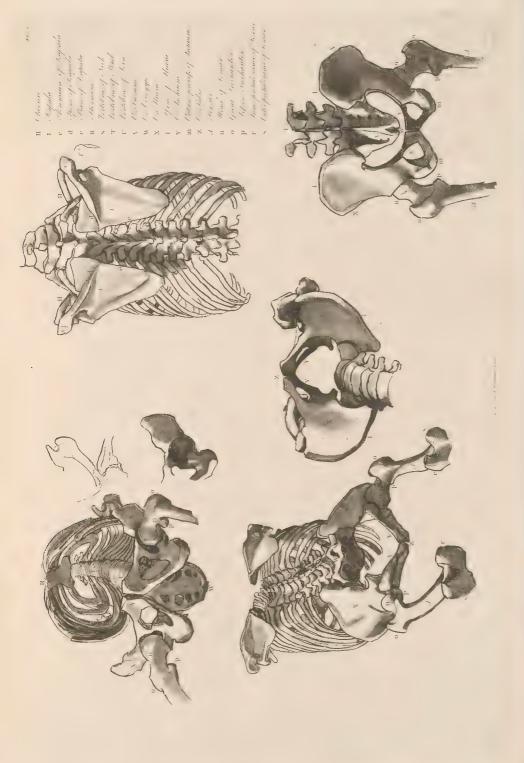


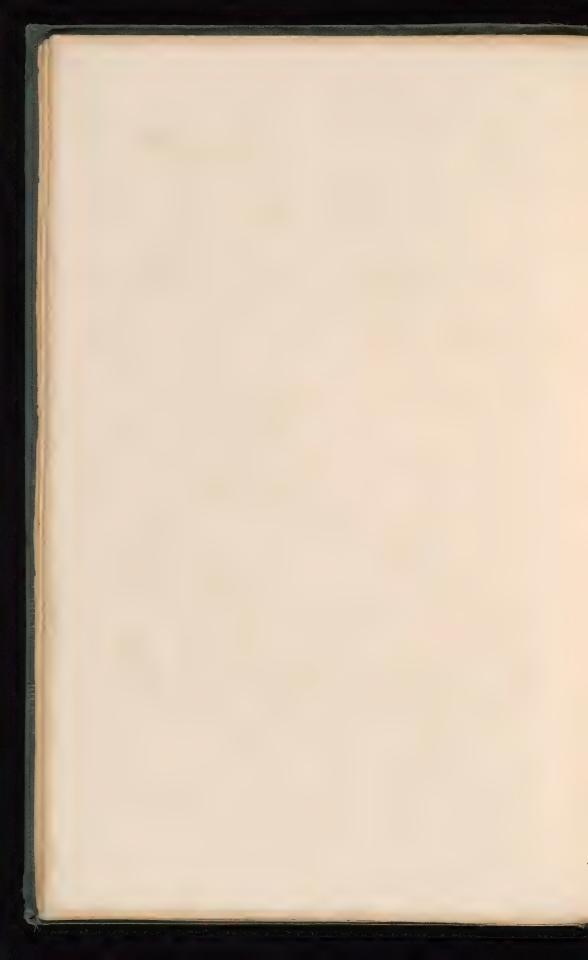
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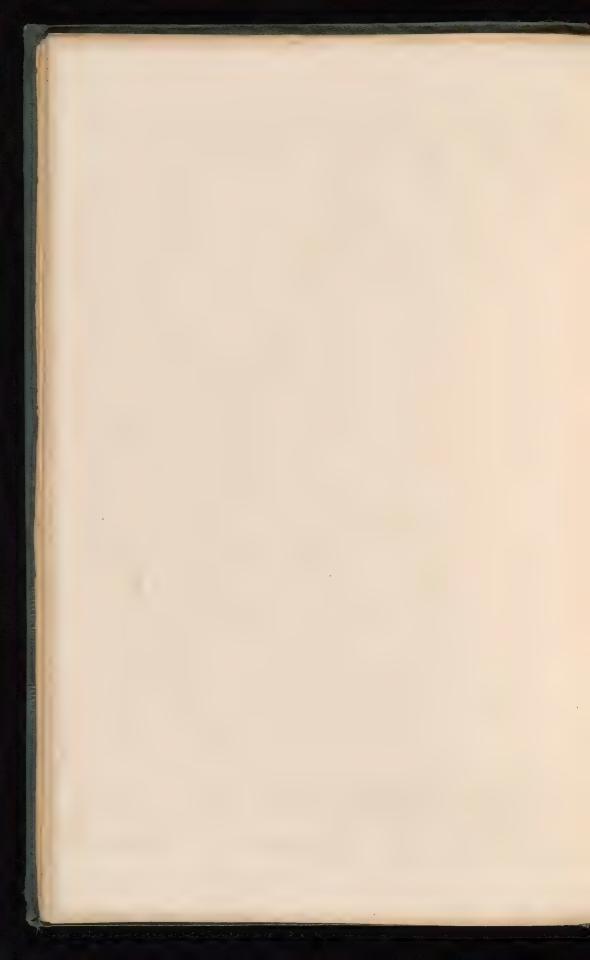






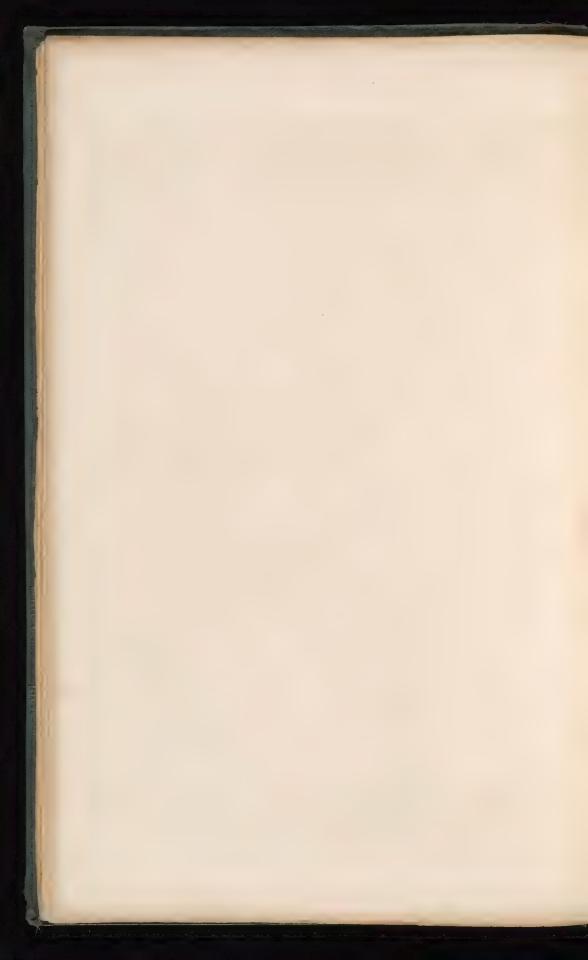








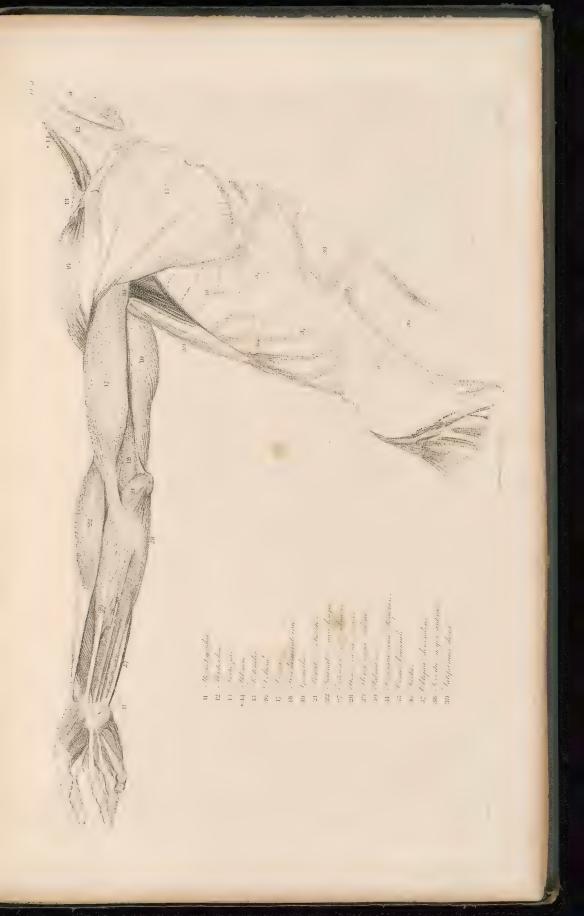
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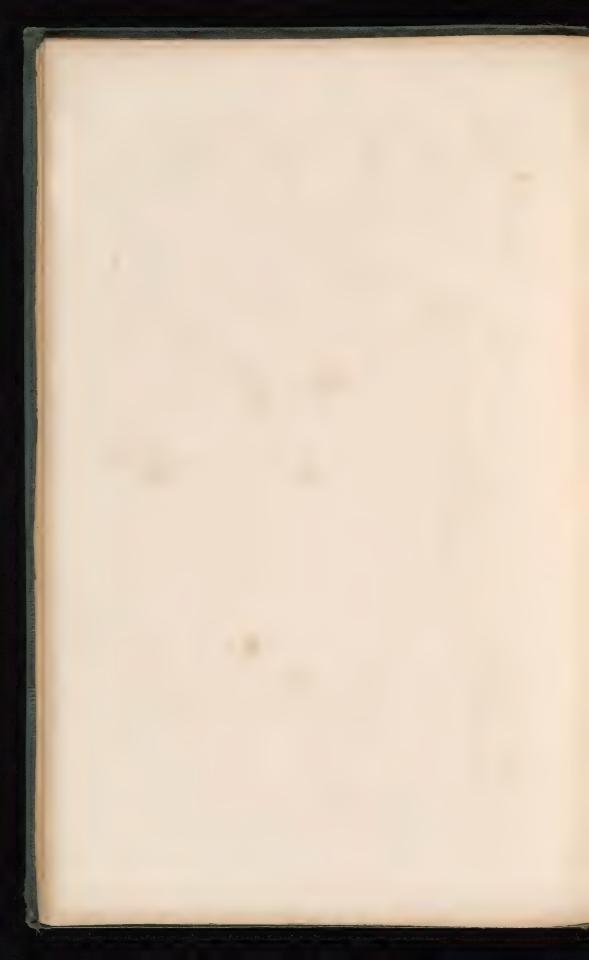




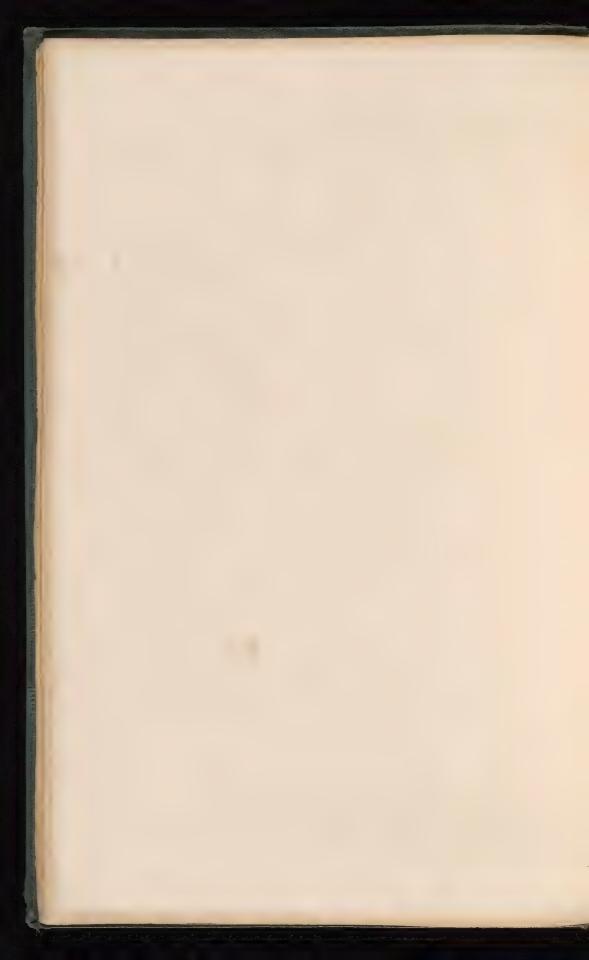




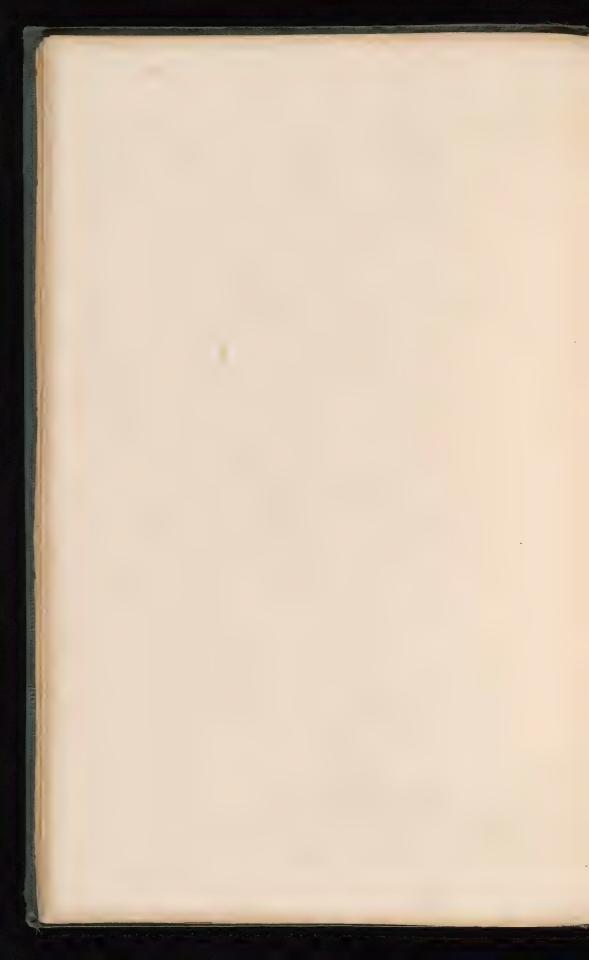






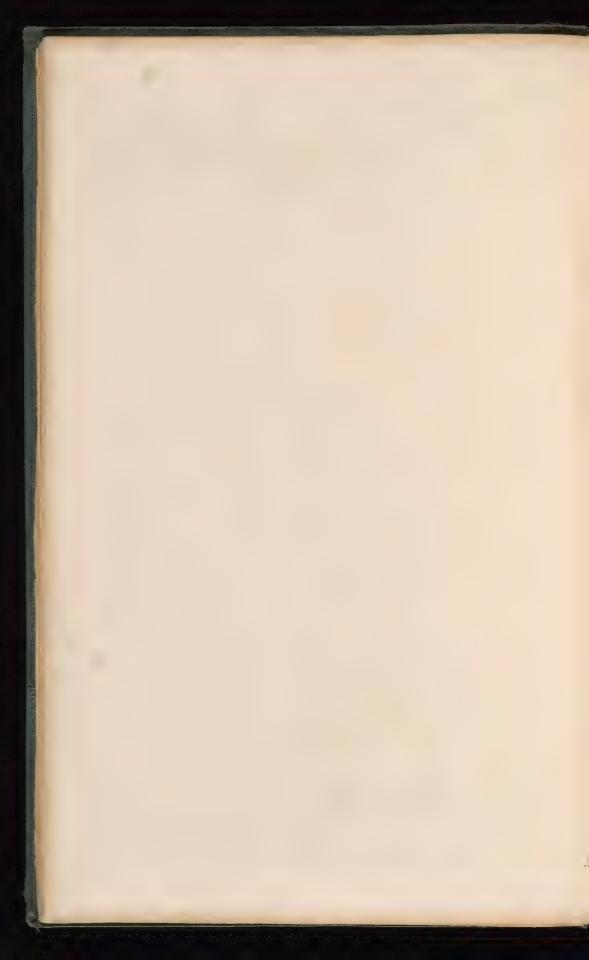


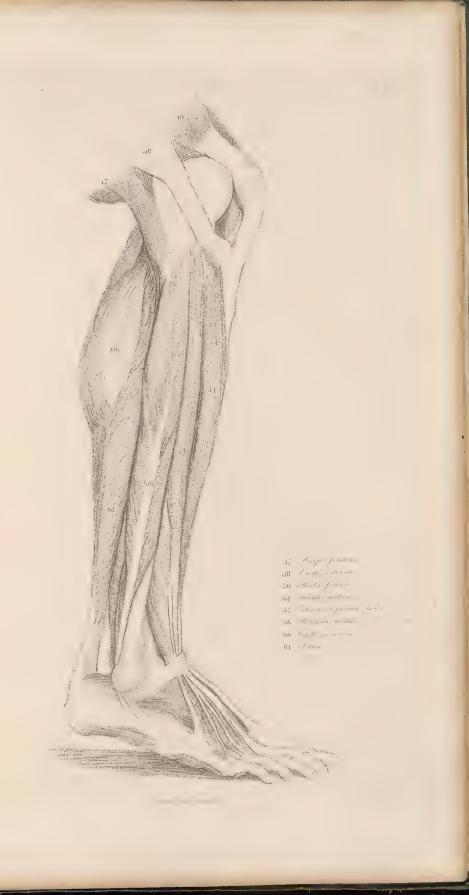


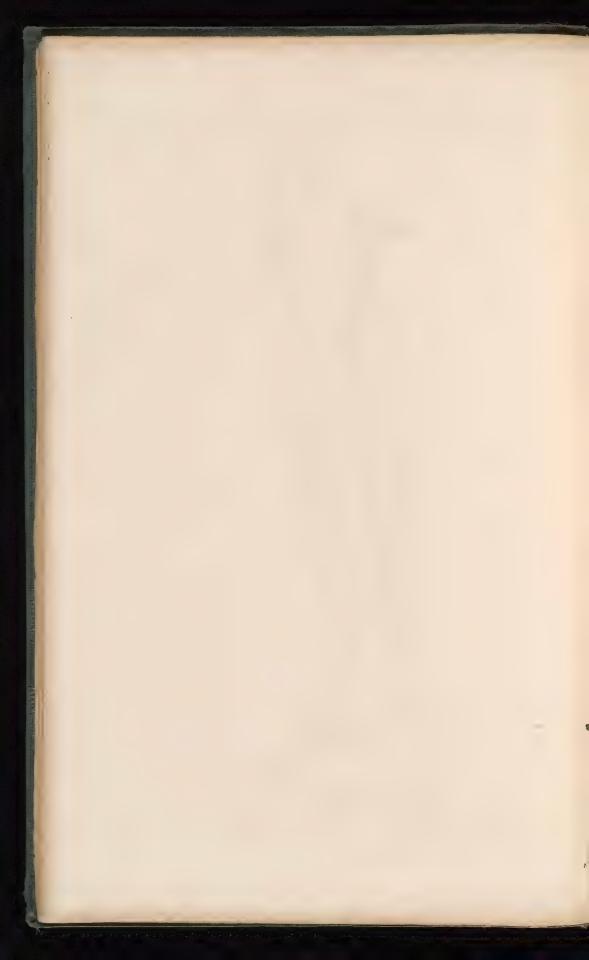




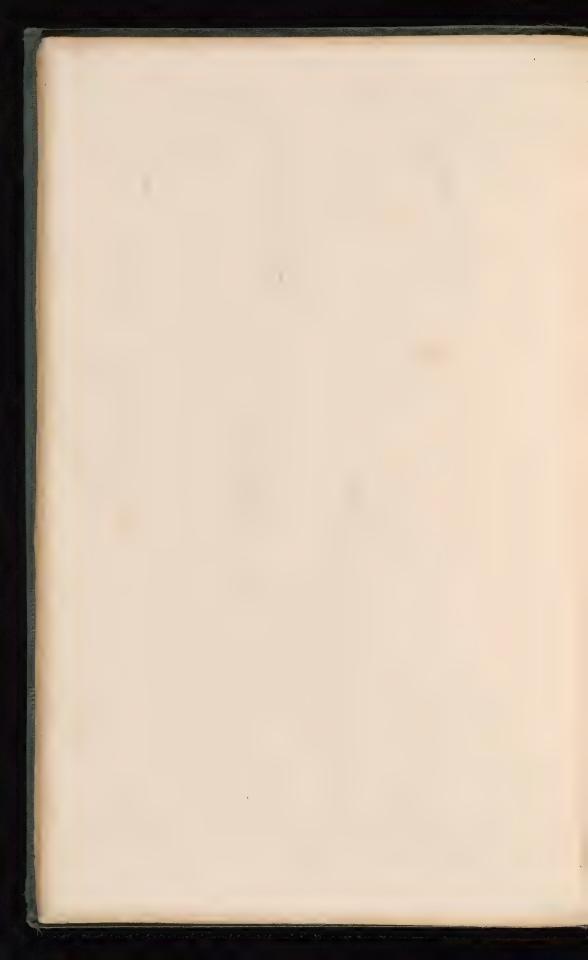
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